

B.Sc. First Year (Data Science) NEP Semester-I
BSCDS011 - Data Structure and Algorithm Using Python

P. Pages : 1

Time : Three Hours



GUG/S/25/15255(S)

Max. Marks : 80

1. a) What do you mean by 'Object-Oriented Programming' (OOP)? Explain in detail. 8
b) Explain classes and objects with an example. 8
OR
c) What is inheritance? Explain its types. 8
d) Explain the types of variables and methods. 8
2. a) Explain data structures and their types. 8
b) Explain comprehensions and their types. 8
OR
c) What are Python-specific data structures? Explain in detail. 8
d) Explain the following terms: 8
i) String ii) Slicing
3. a) Explain arrays and their types with an example. 8
b) What is searching? Explain linear search and binary search 8
OR
c) Explain operations on arrays with an example. 8
d) Explain sorting and its types in detail. 8
4. a) What is a priority queue? Explain with a suitable example. 8
b) What is a stack? Explain the implementation of stacks and their applications. 8
OR
c) Explain queues and their applications. 8
d) Describe the following in detail: 8
i) Singly Linked List
ii) Doubly Linked List
iii) Circular Linked List
5. Write **any two** of the following questions.
a) Describe tree structures and their properties. 8
b) Differentiate: 8
i) Directed vs. Undirected Graphs
ii) Weighted vs. Unweighted Graphs
c) In AVL trees, explain the following: 8
i) Insertion ii) Deletion
d) Explain all tree terminologies in detail. 8
e) Explain tree traversal and its types in detail 8
